

10010828-1

10/617,547

REMARKS

This is a full and timely response to the non-final Official Action mailed July 30, 2007. Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

In preparing the present response, Applicant discovered that claim number 83 was inadvertently omitted. Consequently, claims 84-94 have been renumbered herein to correct this error.

Claims 19-26 and 51-72 were withdrawn from consideration under a previous Restriction Requirement and cancelled without prejudice or disclaimer. Thus, claims 1-18, 27-50 and 73-93 are currently pending for further action.

Prior Art:

Claims 1-13, 27-40, 43, 44, 46-50, 76, 81, 86 and 92 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,440,594 to Kindler et al. ("Kindler"). For at least the following reasons, this rejection is respectfully traversed.

Claim 1 recites:

A device comprising:

an electronically controllable drop ejection device *comprising a jetting device* in fluid communication with an electrochemical cell, the jetting device configured for outputting *a measured stream of liquid droplets* of a chemical composition capable of oxidative reaction into the electrochemical cell.

(Emphasis added).

Claim 27 recites:

An electrochemical system comprising:

10010828-1

10/617,547

an electrochemical cell capable of sustaining at least one oxidation reaction process; and

a fuel supply apparatus delivering a composition containing at least one compound capable of oxidative reaction into the electrochemical cell, the fuel supply apparatus comprising at least one electronically controllable drop ejection device and at least one fluid storage chamber,

*wherein said electronically controllable drop ejection device comprises a jetting device configured for outputting a measured stream of liquid droplets of said compound capable of oxidative reaction into the electrochemical cell.*  
(Emphasis added).

Applicant notes that claims 1 and 27 both recite a “jetting device” for outputting “a measured stream of liquid droplets.” (Emphasis added).

At issue here is what constitutes a “jetting device” and a “measured stream of liquid droplets.” These terms are terms of art and have particular meaning that would be recognized by one of ordinary skill in the art. This art-recognized meaning must be considered when construing the claims. *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 759, 221 U.S.P.Q. 473 (Fed. Cir. 1984). Applicant’s specification also defines and uses these terms according to their recognized meaning in the art.

It appears, however, that in trying to give the claim terms their broadest reasonable interpretation, the recent Office Action is ignoring what these terms would mean to one of ordinary skill in the art and is thus reaching the unreasonable conclusion that Kindler teaches the claimed jetting device and measured stream of liquid droplets.

A “stream” is defined as “an unbroken flow (as of gas or particles of matter)” (<http://www.m-w.com/cgi-bin/dictionary>). Thus, a “stream” is not a diffuse cloud of suspended particles, like an aerosol.

Similarly, a “jet” is defined as “a usually forceful stream of fluid (as water or gas) discharged from a narrow opening or a nozzle . . . b : a nozzle for a jet of fluid.” (*Id.*).

10010828-1

10/617,547

Consistent with these definitions and as indicated above, the term "jetting device" has a very specific meaning as a term of art that would be clear to one of ordinary skill. As evidenced by Applicant's own specification, a "jetting device" is defined as a device that emits a stream or jet of ink droplets. (Applicant's specification, p. 15, lines 25-31). A jetting device can direct the stream at a particular target. (Applicant's specification, Fig. 8).

In contrast to claims 1 and 27 and the recited "jetting device," Kindler teaches an "*Aerosol Feed Direct Methanol Fuel Cell.*" (Kindler, title) (emphasis added). Thus, rather than teaching or suggesting the claimed "jetting device" or "measured stream of liquid droplets," Kindler only teaches aerosol generators for generating an aerosol in a fuel cell. (Kindler, col. 2, lines 10-65).

An aerosol is defined as "a suspension of fine solid or liquid particles in gas." (Merriam-Webster's Online Dictionary, <http://www.m-w.com>). (Emphasis added). Additionally, Kindler describes an aerosol as "liquid fuel droplets suspended in a gas." (Kindler, abstract). Clearly, a "suspension" refers to the state of a substance when its particles are mixed with, i.e. "suspended" in, but undissolved in a fluid or solid. (<http://www.m-w.com/cgi-bin/dictionary>).

The recent Office Action attempts to remove the concept of "suspension" from the definition of an aerosol and holds that any drops traveling through the air are an aerosol. In the words of the Office Action, "[a] steam from a jet is also liquid particles in gas, unless the jet is being administered in a vacuum. (Action of 7/30/07, p. 7).

While a stream or jet does include liquid droplets moving through air, the droplets of a jet are clearly not *in a suspension* in the air and clearly are not an aerosol. One of skill in the art would clearly understand the difference between a jet or stream and an aerosol and would certainly not confuse the two. Consequently, it is clearly unreasonable to disregard the clear

10010828-1

10/617,547

distinction between a jetting device that produces a jet or stream of liquid droplets directed at a particular target and an aerosol generator that produces a cloud of particles in a suspension.

Thus, Kindler does not teach or suggest the claimed "jetting device configured for outputting a measured stream of liquid droplets" to an electrochemical cell. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection based on Kindler of claims 1 and 27, and their respective dependent claims, should be reconsidered and withdrawn.

Independent claim 43 recites:

A power generator comprising:  
an electrochemical cell having at least one reactive surface;  
an electronically controllable jetting device supplying a fuel to the at least one reactive surface in the electrochemical cell; and  
*a recirculating circuit configured to convey a portion of at least one chemical byproduct produced in the electrochemical cell into reintegrative contact with the fuel.*  
(Emphasis added).

Independent claim 48 recites:

A device comprising: a storage chamber containing a fuel;  
an electrochemical cell associated with the fuel storage chamber;  
an electronically controllable jetting device for delivering discrete quantities of fuel from the storage chamber to the electrochemical cell;  
*a recirculation circuit transporting at least a portion of a byproduct material produced in the electrochemical cell into contact with the fuel delivered from the storage chamber;* and  
a power consuming device powered by the electrochemical cell.  
(Emphasis added).

10010828-1

10/617,547

Applicant wishes to note that in the highlighted portions of claims 43 and 48 above, the claims do not simply recite a byproduct of the reaction transported in a recirculating or recirculation circuit. Rather, claim 43 recites a recirculating circuit configured to convey "at least one chemical byproduct *produced in the electrochemical cell.*" (Emphasis added). Similarly, claim 48 recites a recirculation circuit transporting "a byproduct material *produced in the electrochemical cell.*" (Emphasis added). The recent Office Action has improperly ignored these explicit recitations of the claims.

In applying Kindler, the Office Action (p. 3) cites the following.

Carbon dioxide gas produced by the above reaction is withdrawn along with a portion of the fuel aerosol (suspension of methanol droplets in a gas comprising carbon dioxide) from anode chamber vent 23. The liquid methanol droplets may pass through a duct 31 to a droplet recovery unit 19 where liquid methanol is separated from the gas. Liquid methanol may be returned to the methanol pump 20 through duct 29. (Kindler, col. 10, lines 13-32).

Thus, Kindler teaches that unused fuel (i.e., methanol) is separated from the byproducts produced in the reaction (e.g., carbon dioxide) and *then* returned to the methanol pump (20). The unused fuel is a substance that exists in the system prior to the reaction in the electrochemical cell. It is a byproduct of the reaction, but it is not a byproduct produced in the electrochemical cell. Thus, Kindler does not teach or suggest the claimed recirculating circuit in which a portion of at least one chemical byproduct *produced in the electrochemical cell* is reintegrated into the fuel supply.

Consequently, Kindler does not teach or suggest the power generator of claim 43 comprising the claimed recirculating circuit or the device of claim 48 comprising the claimed recirculation circuit. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051,

10010828-1

10/617,547

1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131. For at least these reasons, the rejection based on Kindler of claims 43 and 48, and their respective dependent claims, should be reconsidered and withdrawn.

Additionally, various dependent claims of the application recite further subject matter that is clearly patentable over the cited prior art. Specific, non-exclusive examples follow.

Claim 3 recites:

a channel for removing a byproduct produced by the oxidative reaction from the electrochemical cell, the channel communicating with the electronically controllable drop ejection device, wherein the electronically controllable drop ejection device introduces the reaction byproduct into contact with the chemical composition capable of oxidative reaction in a stoichiometric relationship appropriate for function of the electrochemical cell.

Claims 13, 33 and 38 recite similar subject matter. As demonstrated above with respect to claims 43 and 48, Kindler does not teach or suggest this subject matter of recirculating a byproduct *produced in an electrochemical cell* back into the fuel stream. For at least this additional reason, the rejection of claims 3, 13, 33 and 38, and their respective dependent claims, should be reconsidered and withdrawn.

Claim 4 depends from claim 3 and recites “wherein the drop ejection device is configured to affect proportionate delivery of the byproduct of oxidative reaction and the chemical composition capable of oxidative reaction into contact with the electrochemical cell.” Kindler does not teach or suggest this subject matter. For at least this additional reason, the rejection of claim 4 should be reconsidered and withdrawn.

Claim 6 recites “an admixer in fluid communication with the drop ejection device, the admixer tank configured to receive the chemical composition capable of oxidative reaction and at least one other additional material.” Claims 37 and 47 recite similar subject matter. In

10010828-1

10/617,547

contrast, Kindler fails to teach or suggest this subject matter. The recent Office Action refers in this regard to Kindler's production of an aerosol in which "the liquid fuel is admixed with the gas in which it is suspended." (Action of 7/30/07, p. 8). Thus, in the view of the Office Action, the aerosol generator taught by Kindler is somehow read on by both the claimed jetting device and admixer that feeds the jetting device. This is clearly unreasonable. For at least this additional reason, the rejection of claims 6, 37 and 47 should be reconsidered and withdrawn.

Claim 8 recites "wherein the nozzle member directs ejection of chemical composition capable of oxidative reaction into a *liquid* fluid stream, the fluid stream being conveyed onto the anode of the electrochemical cell." (Emphasis added). In contrast, as demonstrated above, Kindler teaches the delivery of an aerosol, not a liquid fluid stream, to an electrochemical cell. Consequently, Kindler clearly fails to teach or suggest the subject matter of claim 8. For at least this additional reason, the rejection of claim 8 should be reconsidered and withdrawn.

Claim 10 recites "a first electronically controllable drop ejection device is in fluid communication with a first composition capable of oxidative reaction and a second electronically controllable drop ejection device is in fluid communication with at least one second composition capable of admixture with the first chemical composition in a manner which facilitates the oxidative reaction." As demonstrated above, Kindler fails to teach or suggest this subject matter. For at least this additional reason, the rejection of claim 10 should be reconsidered and withdrawn.

Claim 31 recites "wherein the composition containing at least one chemical component capable of undergoing oxidative reaction is contained in a first fluid storage chamber and wherein a second fluid storage chamber contains at least one compound which

10010828-1

10/617,547

is complementary to the oxidative process occurring in the electrochemical cell.” Claim 50 recites similar subject matter. In this regard, the recent Office Action refers to Kindler at col. 5, lines 51-54 and Fig. 1, element 26. (Action of 7/30/07, p. 8). However, both of these portions of Kindler refer only to a single “bottled oxygen supply.” Neither citation teaches or suggests the claimed first and second fluid storage chambers or the different materials stored respectively therein. For at least this additional reason, the rejection of claims 31 and 50 should be reconsidered and withdrawn.

Claim 46 recite “a regulator, the regulator operable on the recirculating circuit to deliver measured quantities of recirculated byproduct into contact with the fuel in at a specified ratio range, the specified ratio range being one which will facilitate oxidative reaction processes proceeding in the electrochemical cell.” As explained above, the recirculated byproduct of claim 46 is specifically recited as a byproduct *produced in the electrochemical cell*. As further explained above, Kindler does not teach or suggest any such circulating byproduct and, therefore, cannot teach or suggest the claimed regulator of claim 46 for delivering measured quantities of such a byproduct. For at least this additional reason, the rejection of claim 46 should be reconsidered and withdrawn.

Claims 14-18, 41, 42 and 45 were rejected as unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent No. 5,746,985 to Takahashi (“Takahashi”) This rejection is respectfully traversed for at least the same reasons given above with respect to claims 1, 27 and 43 and for the following additional reasons.

Additionally, claim 14 recites “wherein the electronically controllable drop ejection device comprises a resistor surface having at least one catalytic material positioned thereon, the catalytic material reactive with a component in the chemical composition capable of

10010828-1

10/617,547

oxidative reaction to effect at least partial catalytic reforming of the component of the chemical composition.” Claims 16 and 41 recite similar subject matter. Applicant notes that the resistor surface with the catalytic material is recited in the claims as being in the drop ejection device. Emphasizing this point, claim 15 further recites “wherein catalytic reforming occurs prior to exit from the drop ejection device.”

The Office Action acknowledges that Kindler fails to teach or suggest the subject matter of claim 14 and so cites to Takahashi. (Action of 7/30/07, p. 8). Takahashi teaches “a heating resistor disposed inside a *reforming reactor*.” (Takahashi, col. 2, lines 63-64) (emphasis added). Takahashi further teaches that the heating resistor can be embedded in a catalyst. (Takahashi, col. 3, lines 3-5). However, Takahashi does not teach or suggest such a reactor disposed in a drop ejection device as claimed. Consequently, the combination of Takahashi and Kindler fails to teach or suggest all the features of claims 14-17, 41 and 42.

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966) to support a rejection under § 103, the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue in view of the ordinary skill in the art. In the present case, the scope and content of the prior art, as evidenced by Kindler and Takahashi, did not include the claimed “resistor surface having at least one catalytic material positioned thereon” in a jetting device. The existence and advantages of this arrangement are wholly outside the scope and content of the cited prior art. Therefore, Kindler and Takahashi cannot support a rejection of claim 14, 16 and 41 under 35 U.S.C. § 103(a) and *Graham*.

Claims 73-75, 78-80, 84, 85, 89-91 and 94 were rejected as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent No. 6,372,483 to

10010828-1

10/617,547

Schleifer et al. ("Schleifer"). This rejection is respectfully traversed for at least the same reasons given above with respect to the various independent claims and for the following additional reasons.

Claim 73 recites "wherein said drop ejection device comprises an inkjet drop ejection device." The Office has conceded that Kindler fails to teach or suggest this subject matter. (Action of 2/9/07, p. 5). Consequently, the Action cites to Schleifer, which mentions an inkjet drop ejection device, and proposes to combine the teachings of Kindler and Schleifer in this regard. (*Id.*).

This proposed combination ignores the facts that Kindler calls for an aerosol generator, as demonstrated above, and an inkjet drop ejection device is *not* an aerosol generator. Consequently, it is entirely unclear how one of skill in the art would have been lead to combine the teachings of Kindler and Schleifer as proposed in the recent Office Action. The same is true of claim 74 which recites "a thermal drop ejection device," and claim 75 which recites "a piezoelectric drop ejection device." Claims 78-80, 84, 85, 89 and 90 also recite parallel subject matter.

A large number of devices may exist in the prior art where, if the prior art is ignored as to its content, purpose, mode of operation and general context, the several elements claimed by the Applicant, if taken individually, may be disclosed. However, the important thing to recognize is that the reason for combining these elements in any way to meet Applicant's claims only becomes obvious, if at all, when considered from hindsight in the light of the application disclosure. The Federal Circuit has stressed that the "decisionmaker must step backward in time and into the shoes worn by a person having ordinary skill in the art when the invention was unknown and just before it was made." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566 (Fed. Cir. 1987). To do otherwise would be to

10010828-1

10/617,547

apply hindsight reconstruction, which has been strongly discouraged by the Federal Circuit. *Id.* at 1568. Respectfully, "it is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious"; *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1141, 227 USPQ 543, 550 (Fed. Cir. 1985); *W.L. Gore & Assocs. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)

"To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983).

Therefore, without some reason in the references to combine the cited prior art teachings, with some rational underpinnings for such a reason, the Examiner's conclusory statements in support of the alleged combination fail to establish a *prima facie* case for obviousness. See, *KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. \_\_\_\_ (2007) (obviousness determination requires looking at "whether there was an apparent reason to combine the known elements in the fashion claimed . . .," citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness," *KSR* at 14)).

For at least these additional reasons, the rejection of claims 73-75, 78-80, 84, 85, 89, 90 should be reconsidered and withdrawn.

Lastly, the recent Office Action rejected claims 77, 82, 88 and 93 as being unpatentable under 35 U.S.C. § 103(a) over the combined teachings of Kindler and U.S. Patent No. 5,667,649 to Bushman ("Bushman") and U.S. Patent No. 5,789,585 to Lee et al.

10010828-1

**RECEIVED  
CENTRAL FAX CENTER****OCT 22 2007**

10/617,547

("Lee"). This rejection is respectfully traversed for at least the same reasons given above with respect to the various independent claims and for the following additional reasons.

Claim 77, for example, "wherein said electrochemical cell comprises an anode comprised of stainless steel and a cathode comprises of a transition metal or transition metal oxide." According to the Office Action, Bushman teaches the claimed stainless steel anode. (Action of 7/30/07, p. 6). However, Bushman has nothing to do with an electrochemical cell. Rather, Bushman teaches a stainless steel anode as an impressed current anode. (Bushman, title). Similarly, Lee does not teach or suggest an electrochemical cell or electrochemical cell electrodes. Rather, Lee teaches cathodes for use in a non-aqueous battery. (Lee, abstract).

As noted above, if the prior art is ignored as to its content, purpose, mode of operation and general context, the several elements claimed by the Applicant, if taken individually, may be disclosed. This, however, will not reasonably support a rejection of Appellant's claims. Rather, under *Graham*, the electrochemical cell recited in claim 77 with a stainless steel anode and a transition metal or transition metal oxide cathode is outside the scope and content of the cited prior art.

For at least these additional reasons, the rejection based on Kindler, Bushman and Lee should be reconsidered and withdrawn.

Conclusion:

In view of the foregoing arguments, all claims are believed to be in condition for allowance over the prior art of record. Therefore, this response is believed to be a complete response to the Office Action. However, Applicants reserve the right to set forth further arguments supporting the patentability of their claims, including the separate patentability of the dependent claims not explicitly addressed herein, in future papers. Further, for any

10010828-1

10/617,547

instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03.

If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,



Steven L. Nichols  
Registration No. 40,326

DATE: October 22, 2007

Steven L. Nichols, Esq.  
Managing Partner, Utah Office  
**Rader Fishman & Grauer PLLC**  
River Park Corporate Center One  
10653 S. River Front Parkway, Suite 150  
South Jordan, Utah 84095  
(801) 572-8066  
(801) 572-7666 (fax)

**CERTIFICATE OF TRANSMISSION**

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number 571-273-8300 on October 22, 2007. Number of Pages: 30



Rebecca R. Schow